

# Variation of fundamental constants from Big Bang to atomic clocks: theory and observations

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Theories unifying gravity with other interactions suggest temporal and spatial variation of the fundamental "constants" in expanding Universe. I discuss effects of variation of the fine structure constant  $\alpha = e^2/\hbar c$ , strong interaction and fundamental masses. The measurements of these variations cover lifespan of the Universe from few minutes after Big Bang to the present time and give controversial results. There are some hints for the variation in Big Bang nucleosynthesis and quasar absorption spectra data. A very promising method to search for the variation of the fundamental constants consists in comparison of different atomic clocks. Huge enhancement of the relative variation effects happens in transition between accidentally degenerate nuclear, atomic and molecular energy levels. Possible dependence of the fundamental constants on gravitational potential has also been studied.